



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION I  
JOHN F. KENNEDY FEDERAL BUILDING (HBT)  
BOSTON, MASSACHUSETTS 02203-2211

July 22, 1998

Mr. Emil Klawitter  
Northern Division, Naval Facilities Engineering Command  
Code 1823/EK  
10 Industrial Highway, Mailstop 82  
Lester, PA 19113-2090  
(eeklawitter@efdnorth.navfac.navy.mil)

Re: Naval Air Station, Brunswick, Maine  
*Comments to Site 9 Draft Proposed Remedial Action Plan (PRAP)*

Dear Mr. Klawitter:

Thank you for the opportunity to review and comment to the above document. The EPA concurs with the Navy's proposed remedy of monitored natural attenuation, institutional controls, long term monitoring and 5 year reviews. This consensus was reached at a management review meeting on 15 July 1998 in which the Maine DEP participated.

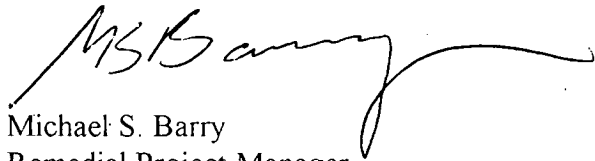
The EPA has a significant number of comments to the draft PRAP, mostly regarding specific language and not substantive to the remedy. We do have concerns regarding the analysis of remedial alternatives, risk assessment and long term monitoring sections. Specific comments and an example table and text on remedial alternatives are in the attachment.

Selection of a monitored natural attenuation remedy for a plume for which uncertainties regarding exact upgradient source (level and extent) and expected required duration caused much discussion within EPA and with the ME DEP. While we concur it is the appropriate remedy for site 9, we would like to see some mention regarding these issues in the PRAP; with a more detailed examination in the ROD. We are also concerned about the institutional controls and would like to discuss more specifics, including the geographical delineation, at the RAB later this month. See also specific comments.

The PRAP should also relate clearly that the interim remedy already in place at Site 9 is essentially the same as the preferred final remedy and that the additional investigations required by the interim ROD failed to identify any distinct source areas at the site, thus making the interim remedy an appropriate final remedy for Site 9.

I look forward to resolving these comments with you at the 29 July technical RAB meeting, or before at your convenience. Please call me at 617-223-5579 or E-mail me at [barry.michael@epamail.epa.gov](mailto:barry.michael@epamail.epa.gov) for any questions. Due to Email system and word processing application compatibility problems, the primary delivery of this letter will be by US Mail with fax copies to yourself and ME DEP. I will email a copy in word perfect 5.1 and rich text format (rtf) to all email addresses for testing purposes.

Sincerely, ..



Michael S. Barry  
Remedial Project Manager,  
Federal Superfund Facilities Section

Attachment

Enclosure (1) NASB OU Summary Table, 1 page

Enclosure (2) Excerpt from a recent Proposed Plan, including a table ranking Alternatives against the Nine CERCLA Criteria.

cc. Greg Apraham/NASB  
Claudia Sait/ME DEP (also by E-mail to [claudia.b.sait@state.me.us](mailto:claudia.b.sait@state.me.us))  
Susan Weddle/BACSE  
Carolyn LePage/LePage Environmental (also by E-mail to [clepagegeo@aol.com](mailto:clepagegeo@aol.com))  
Rene Bernier/Topsham Community Rep.  
Pete Nimmer& Charles MacLeod/EA Environmental  
Jeffery Brandow/ABB-ES (also by E-mail to [jbrandow@harding.com](mailto:jbrandow@harding.com))  
Rayo Bhumgara/Gannett-Fleming (also by E-Mail to [rbhumgara@gfnet.com](mailto:rbhumgara@gfnet.com))  
Tom Fusco/BACSE  
Ed Benedickt/Brunswick Conservation Commission

## ATTACHMENT

The following are the EPA's specific comments to the Draft Proposed Remedial Action Plan (PRAP) for Site 9 at the Naval Air Station Brunswick, Maine.

1. Page 1, Introduction, ¶ 1:

- a. State that the Plan addresses contamination in soil (ash landfill) as well as the other media. This is confusing in part because the title of the interim ROD for site 9 (OU6) was the "Groundwater Operable Unit at Site 9". However the interim ROD went on to say that the final ROD would cover risks from "other sources" (paragraph 3, page 24). Other media have also been analyzed as part of the overall site 9 effort as well (though risks appear to be minimal, if at all.).
- b. The second sentence is difficult to follow and should be simplified to read "In accordance with Section 117(a) of the **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)**, the law known as Superfund, the Proposed Plan presents the preferred remedial alternative for Site 9 and requests the Public's involvement in the selection of a final remedy".

2. Page 1, Introduction, ¶ 2:

- a. The reference to EPA and MEDEP as "lead agencies" is confusing and should be revised to reflect the fact that the Navy is the lead agency at BNAS and EPA and MEDEP provide regulatory oversight of Navy environmental activities there. The reference to "Public Stakeholders" as a "lead agency" is inaccurate and should be deleted. Also, it is suggested that if the Plan is going to use the term "Public Stakeholders" elsewhere, the term be defined in the Glossary.
- b. With regard to the bulleted list of objectives: (1) revise the first objective to read "Update information contained in the Interim **Record of Decision** issued for Site 9 in 1994 with the results of subsequent investigations"; (2) revise the second to read "Explain the preferred remedial alternative the Navy has proposed for Site 9"; and (3) add a new third objective, "Describe the other remedial alternatives analyzed for Site 9".
- c. The last two bullets are good coverage of public information-leave as is.
- d. The cleanup proposal box is concise and draws the readers attention to the substance of the PRAP. This might be a good place to insert another bullet linking the interim ROD and negative source investigation mentioned in the general comments.

3. Page 2, The Remediation Proposal:

- a. It may be less confusing for the reader to call this section “The Proposed Remedial Action”, which reflects the title of the document.
- b. The order of the second and third bullets should be switched. The section would be a more effective summary of the rationale underlying the Navy’s preferred alternative if the reader learns that vinyl chloride is the primary constituent of concern at Site 9 and is only present in the groundwater before learning that there are no identified source areas for vinyl chloride at the site.
- c. Use of the phrase “the Site 9 ground-water operable unit” in the third bullet may be somewhat confusing to the average reader. It is suggested that the Plan instead state that vinyl chloride is only present “in the groundwater at Site 9”. Also, use the term “groundwater” consistently throughout the Plan. Right now, it appears on various pages as “groundwater”, “ground-water”, and “ground water”.
- d. With regard to the fourth bullet: (1) indicate whether there has been long-term monitoring of the soil at Site 9 as well; (2) indicate that the sediment is stream sediment; (3) indicate the source of the leachate (suggest using “groundwater seep” instead of “leachate”); and (4) state that the VOCs whose concentrations are decreasing include vinyl chloride. In light of monitoring round 11 results, the phrase “...stabilized and decreasing at many sampled locations.” is misleading, though true and could beg more detailed questions. Suggest using language to the effect of “indicate stable concentrations or varying levels within a stable range, etc”.
- e. In the fifth bullet, delete “and application” after “for the use” as institutional controls are imposed or instituted, not applied.
- f. In the paragraph discussing the requirements of the interim ROD, it would be useful here to explain the connection between the interim remedy and the preferred final remedial alternative in the same vein as in the general comment and specific comment 2.d. above.
- g. The public information and how to respond section is very helpful and establishes a obliging tone for the PRAP (no response required!).

4. Page 3, Site History:

- a. This section adeptly relates the long history of site 9 (no response required!).
- b. Move the first paragraph on Page 3 to the end of the Site History section, where it will make more sense chronologically, and so that the reader will learn what the

areas of concern are at the site before learning what remedial actions are being taken to address them. Also, describe the “maintenance and corrective measures” that the Navy is currently undertaking in accordance with the interim ROD in more detail (one or two sentences).

- c. Identify the authors and state the issuance dates for the Initial Assessment Study and Pollution Abatement Study.
  - d. Use one term consistently throughout the Plan to describe the inactive ash landfill area. Right now, it appears on various pages as the “inactive ash landfill/dump area”, the “ash landfill”, the “inactive ash landfill”, the “former ash landfill/dump area”, and the “ash disposal area”. This may be confusing to some readers.
  - e. The Plan should be more specific about what types of contaminants (e.g., VOCs or inorganics or both) are affecting what media in the area southeast of Building 201 (e.g., just groundwater, or soil as well). The phrase “potential source of impact” is too vague and fails to provide this meaningful information. Suggest adding to this sentence a phrase to the effect of “...due to a septic system and reported dumping of...”.
  - f. At the end of this section, add a new paragraph that summarizes the Navy’s overall remediation strategy, major progress to date for NASB and addresses the role of the Site 9 final ROD in that strategy. This will help put site 9 in perspective as not one of the “major” OUs at NASB. A good way to do this would be with some leading text then using a table; an example is enclosed. This paragraph should follow the paragraph (moved from the beginning of the section) about the interim ROD and Long-Term Monitoring Plan already in place at Site 9.
5. Pages 3-4, Summary of Investigations: The last paragraph on Page 3 and the first paragraph on Page 4 both appear to discuss the Phase I RI. If so, consolidate them; if not, explain the difference between the RI addressed in each paragraph. In either case, provide parenthetical citations to the authors and issuance dates of the RI and supplemental RI documents issued in 1990 and 1991. Also, the average reader may not understand what is meant by the phrase “distribution of soil impact” in the first paragraph on Page 4.
6. Page 4, Summary of Investigations:
- a. Identify the 1993 “additional study” by title, author and date. Is this the Technical Memorandum prepared by ABB in 1994?
  - b. Identify the primary VOCs present in Site 9 groundwater “at concentrations exceeding Federal and State standards”.
  - c. Revise the bulleted paragraph about PAHs at the inactive ash landfill/dump area to

read “**Polycyclic aromatic hydrocarbons (PAHs)** were present in the ash in the inactive ash landfill/dump area but not in the groundwater downgradient from the area”. Would it more accurate to say PAHs were present in the soil in that area, not “the ash”.

- d. Identify the primary inorganics present in the groundwater downgradient of the inactive ash landfill/dump area. Also, the average reader may not understand the term “analytes”; it is suggested that the term “contaminants” be used instead.
- e. In the last bullet, suggest using “groundwater seeps” instead of “leachate” and identify that the sediment is stream sediment in the unnamed streams.

7. Page 4, Interim Record of Decision:

- a. Use of the phrase “the ground-water operable unit at Site 9” in the first paragraph may be confusing to the average reader, even though this was the title of the interim ROD. It is suggested that the Plan instead state that the interim ROD “addressed methods to control the potential hazard posed by the groundwater contamination at Site 9”. Also, substitute “selected interim remedial action” for “selected interim remediation”. Per comment 1.a. above and language in the interim ROD, it is understood by the EPA that the final ROD will include other media and impacts from sources other than groundwater. (More in risk section comments).
- b. Also, state somewhere in this section that the remediation goals in the interim ROD were based on MCLs and MEGs.

8. Page 4, Source Investigations:

- a. Did these investigations provide any additional information, or confirm previous findings, on PAH in the ash/soil in the inactive ash landfill/dump area, inorganics in site groundwater, or PAH and inorganics in site sediments or leachate? (This section only mentions the results of groundwater sampling for VOCs.)
- b. Did these investigations confirm that the septic system was a not possible source area for VOCs? If so that might be important to the reader.
- c. With regard to the recommendation to continue the long-term monitoring program, state specifically which contaminants were declining in concentration with time, and in what media (i.e., was it all the primary COCs in all affected media or just VOCs in the site groundwater?). Conversely, to make this bullet simpler, it could be indicated that an overall declining trend has been observed for VOCs/inorganics in media as appropriate.

9. Page 4, Long-Term Monitoring Plan:

- a. Use of the phrase "the Site 9 ground-water operable unit Record of Decision" in the first paragraph may be confusing to the reader. It is suggested that the Plan instead use the phrase "the interim Record of Decision addressing the groundwater contamination at Site 9".
- b. Identify the author and issuance date of the Long-Term Monitoring Plan.
- c. Clarify whether the ten sampling events that have been accomplished to date addressed only groundwater or other media as well. Eleven sampling events have now occurred. Vinyl chloride results of event 11 were mixed; recommend we discuss the wording for this section at the meeting. It appears that either quire general language or an explanation above the normal detail of a PRAP is required here.
- d. On the last paragraph in this section recommend adding a phrase to the effect of "...due to results of the eleven sampling rounds to date and the fact that this area receives storm water runoff from most of the Air Station built-up area.

10. Page 5, Risk Evaluations:

- a. This section concisely summarizes the risks due to groundwater, but should have more specifics as to the scenario (i.e prolonged, ongoing human consumption) and include ecological risk as well. Human Health and ecological risks associated with media other than the groundwater should be summarized also. To be thorough, this section should state that the risk assessment indicated that none of the other contaminants present at the site pose an elevated risk to human health or the environment, in groundwater or in any of the other affected media (assuming this is the case).
- b. This section should include the following paragraph: "Actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare, or the environment".
- c. The second paragraph discussion of groundwater use (or non-use) at site 9 is a critical point. Suggest stating that a primary reason for groundwater at site 9 not being a drinking water source is due to (1) NASB water supply from the municipal system, (2) no "plume" migration offsite, or downgradient, and (3) low-yield overburden aquifer would not be a candidate for drinking water production in any case (if this is true).

11. Pages 5-6, Summary of Remedial Alternatives:

- a. This section of the Plan should accomplish the following tasks in the following order: (1) provide a narrative description of each alternative evaluated in light of the information collected in the additional source investigations conducted after the 1994 interim ROD (make sure that the description of each alternative includes information about all of the following: engineering and treatment components, estimated present-worth cost, estimated implementation time (to discuss), and the major ARARs associated with the alternative); (2) identify the preferred alternative; (3) introduce the nine (not eight) evaluation criteria and discuss how they are utilized in the Superfund program; (4) provide the rationale for the preferred alternative by profiling it against the nine criteria and highlighting how it compares to the other alternatives (major advantages and disadvantages); and (5) discuss the Navy's belief that the preferred alternative would satisfy the CERCLA Section 121 findings (including a discussion of the preference for treatment and why it is acceptable that the preferred alternative does not include treatment).
- b. A concise way to convey all this information would again be by tables. Table 1 does a great job of profiling the alternatives.
- c. A second table is needed to address the nine evaluation criteria much more specifically by weighing each alternative against each of the criteria (to meet (4)). An example from a recent Region I Federal Facility is enclosed. The nine CERCLA criteria also should be described briefly and are included in the example. These changes would sufficiently meet the statutorily required nine-criteria analysis of the alternatives.
- d. Introducing this section of the Plan with a statement of the primary objective of the proposed remedial alternatives for Site 9, as the Plan currently does, is useful. It is suggested that language be included in this sentence to note that this primary objective is to prevent human exposure while reducing the concentrations of the constituents of concern to below the federal MCL/State MEG (or some similar wording that indicates how the Navy will measure "success" at the site).

12. Page 5, Table 1:

- a. What is "denotification"? Should this be "notification"? (This word also appears on Page 6 in the discussion of Alternative 2.)
- b. Land use restrictions are a form of institutional control. Also, the term "deed notice" has no legal meaning. It therefore is suggested that the Components section of the Monitored Natural Attenuation part of the table be rewritten to include a bullet stating that "Institutional controls to prevent contact with soil and groundwater and ingestion of groundwater, including notification and land use



restrictions (which will be placed in the Air Station Master Plan or deeds/leases upon any transfer of Site 9 property)". (The existing bullets about land use restrictions and institutional controls should be deleted.). The EPA is concerned about exact IC execution language for the ROD would like to discuss at the RAB. We will supply example from a recent ROD at an operating (non-BRAC) Navy Base for your consideration in the draft ROD. The geographical boundaries proposed by the Navy seem reasonable for soil, but should be broader for groundwater.

- c. Language covering ecological risks, all media and possibly expected remedy duration should be added. The EPA would also like to discuss the assumptions under which the alternative costs were calculated.

13. Page 6, Summary of Remedial Alternatives, Alternative 2:

- a. Why MEDEP approval required to excavate soil in the inactive ash landfill area, but not EPA approval?
- b. Suggest removing the 30-year limitation on five-year reviews. Such a limitation runs directly counter to CERCLA and the NCP, which require five-year reviews for as long as CERCLA hazardous substances that are left in place at a site remain there above levels that allow for unlimited use and unrestricted exposure. Conversely, monitoring (or portions, certain media, etc) could end prior to the 30 year period.
- c. This would be the appropriate place to discuss a rough duration estimate of the remedy to reach the MCL/MEGs (also for alternative 3). Remaining surface water, sediment and ecological risks should be discussed here as well.

### 3. Background

- NAS Brunswick Established 1942; Maritime Patrol Aircraft Operations Mission
- NPL Listing July 22, 1987
- Three- Party Federal Facility Agreement October 19, 1990
- OU Summary for the Installation:

OU/Sites	ROD Date	Remedy
OU1/sites 1,3 (Landfill)	final signed 9/92	landfill cap and slurry wall, pump and treat for gw (metals and VOCs); operational in 1995
OU2/Eastern Plume	interim signed 6/92 final action on OU5	pump and treat for gw (dissolved phase DNAPL); operational in 1995
OU3/sites 5,6 (Landfills)	final signed 8/93	removed to OU1; 1995
OU4/site 8 (Landfill)	final signed 8/93	removed to OU1; 1995
OU5/sites 4,11,13 &EP	final signed 2/98	source removal, continue pump and treat for gw
OU6/site 9 (Neptune Dr.)	interim signed 9/94 final in 3/99	additional source investigation, proposed monitored natural attenuation
OU7/sites 2,7,12 (Landfill)	draft final out 7/97, final signing by 9/98	prior soil cap, proposed limited action-long term monitoring

### 4. Site 9 Description

- Former Incinerator and Ash Landfill:** Operated from 1943 to 1953 when the present barracks were built. Wastes reportedly included solvents that were burned on the ground, paint sludge and possible wastes from the metal shop.
- Mess Hall (Building 201):** Historical information and aerial photographs indicate the area southeast of the mess hall as a potential source of contamination. This area

**Flagstone Brook (Site 26)** is located in the northern section of Pease AFB and originates from two culverts at the northern end of the North Ramp/aircraft parking apron. These two branches drain the North Ramp/aircraft parking apron, the taxiway, a small area of industrial buildings, and Nashua Avenue. Below the confluence of the two branches, Flagstone Brook flows north along the western edge of Landfill 5 (LF-5). Surface runoff and ground water discharge from LF-5 also contribute to flow in Flagstone Brook. Flagstone Brook eventually empties into the Piscataqua River.

## SUMMARY OF SITE RISKS

A baseline risk assessment was prepared as part of the RI process to evaluate whether the contaminant levels detected in each of the four brooks/ditches pose adverse risks to human and ecological receptors.

The human health risk assessment estimated the potential present and future risks to human health posed by contaminants detected in sediments and surface water. Potential human receptors include site workers, residents, and trespassers. The ecological risk assessment estimated potential ecological impacts associated with the chemicals of concern on aquatic life inhabiting the brooks/ditches and the potential risks associated with contaminants bioaccumulating and biomagnifying up the food chain to small mammals feeding on lower level aquatic and terrestrial life.

The results of the risk assessment indicated that the contaminants in Pauls Brook sediment and surface water and McIntyre Brook sediment present potential ecological risks. No significant adverse health effects to human receptors resulting from ingestion of or contact with contaminated sediment or surface water are present or expected in the future at Pauls Brook and McIntyre Brook.

### Pauls Brook

Results of the RI include:

- ➔ Chemicals of concern that potentially present an adverse impact to aquatic and terrestrial life were identified in the sediment and surface water in Pauls Brook.
- ➔ These chemicals of concern include pesticides, metals, and polycyclic aromatic hydrocarbons.
- ➔ Actual or threatened releases of hazardous substances from this site, if not addressed, may present a future threat to public health, welfare, and/or the environment.

### McIntyre Brook

Results of the RI include:

- ➔ Chemicals of concern that potentially present an adverse impact to aquatic life were identified in the sediment at McIntyre Brook.
- ➔ These chemicals of concern include metals and polycyclic aromatic hydrocarbons.
- ➔ Actual or threatened releases of hazardous substances from this site, if not addressed, may present a future threat to public health, welfare, and/or the environment.

## NO FURTHER ACTION SITES

Surface water and sediments in Lower Newfields Ditch and Flagstone Brook do not pose adverse risks to human and ecological receptors. Therefore, no further action is recommended for these sites and do not require remedial action under CERCLA. Environmental monitoring of Flagstone Brook will continue to be conducted as part of the Air Force's requirement to monitor the protectiveness of the Landfill 5 cap. Based upon the results of the risk assessment for Lower Newfields, it has been determined that long-term monitoring of the Lower Newfields Ditch is not warranted.

## SUMMARY OF ALTERNATIVES

Based on information from the RI, the FS determined that remediation is necessary at Pauls and McIntyre Brooks to reduce the potential risks to ecological receptors.

Cleanup goals were developed for contaminated sediment in McIntyre and Pauls Brooks. Sediment cleanup goals were established for polycyclic aromatic hydrocarbons (PAHs), 5 pesticides, and 6 metals in Pauls Brook and for PAHs and 3 metals in McIntyre Brook. Cleanup goals were also established for 2 pesticides and 2 metals in Pauls Brook surface water.

The Feasibility Study for the brooks/ditches evaluated three alternatives for addressing the contaminated sediments at Pauls and McIntyre Brooks. The alternatives evaluated for Pauls and McIntyre Brooks include:

**Alternative 1: No Action** (This alternative is retained as a baseline for comparison purposes during the evaluation of other alternatives.)

*(Continued on page 6)*

- Leave the brooks as they presently exist, with contaminants remaining on site, unchanged.
- Review and evaluate conditions of the brooks every 5 years.

**Alternative 2:** Limited Action/Long-term surface water and sediment monitoring

- Long-term surface water and sediment monitoring in Pauls and McIntyre Brooks.
- Review and evaluate conditions of the brooks every five years.

**Alternative 3:** Excavation, off-base treatment/disposal of contaminated sediment, sediment and erosion control during excavation activities, wetlands restoration, and surface water and sediment quality monitoring.

- Excavation of contaminated sediment from Pauls Brook and McIntyre Brook.
- Sediment and erosion control during sediment excavation.
- Restoration of wetlands impacted or destroyed by sediment excavation.
- Off-base treatment/disposal of the contaminated sediment.
- Long-term surface water and sediment monitoring.

## NINE CERCLA EVALUATION CRITERIA

The Air Force used the nine CERCLA criteria described below to evaluate the pros and cons of the remedial alternatives for Pauls and McIntyre Brooks. The final remedial action plan must meet the first two criteria (protecting public health and the environment and complying with environmental laws and regulations), and must achieve the best balance among the next five criteria. The last two criteria will be evaluated upon completion of the public comment period, as described in the ROD for the brooks/ditches.

**1. Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

**2. Compliance with applicable or relevant and appropriate requirements (ARARs)** addresses whether or not a remedy will meet ARARs or other federal and state environmental statutes and/or provides grounds for invoking a waiver of those statutes and regulations.

**3. Long-term effectiveness** refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human and the environment over time once cleanup goals have been met.

**4. Reduction in toxicity, mobility, or volume through treatment** refers to the anticipated performance of the treatment technologies that may be employed in a remedy.

**5. Short-term effectiveness** refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment during the construction and implementation period.

**6. Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

**7. Cost** includes capital, operations and maintenance costs shown in present worth (today's dollar value).

**8. State acceptance** indicates, based on its review of the RI/FS and proposed plan, whether the state concurs with, opposes, or has no comment on the preferred alternative selected.

**9. Community acceptance** will be assessed in the ROD following review of the public comments received on the RI/FS and the proposed plan.

## EVALUATION OF ALTERNATIVES

Table 1 provides a comparative scoring for Pauls and McIntyre Brooks that indicates how Alternatives 1, 2, 3 meet seven of the nine CERCLA criteria that the Air Force is using to assess cleanup methods for these brooks. Alternative 1 is presented only for the purpose of a baseline comparison of the other alternatives.

As indicated in the comparative ranking table, only Alternative 3 best satisfies criteria 1, the overall protection of human health and the environment, and criteria 2, state and fed-

(Continued on page 7)

eral requirements (ARARs). Alternatives 2 and 3 best satisfy criteria 5, short-term effectiveness while Alternatives 1 and 2 best satisfy criteria 6, implementability. None of the three alternatives meet criteria 4, the reduction of toxicity, mobility, and volume through treatment. Alternative 3 had the highest cost among the three alternatives (\$1,182,000) but will best meet the overall protection goal.

## THE AIR FORCE'S PREFERRED ALTERNATIVE (ALTERNATIVE 3)

The Air Force's preferred alternative for the Pauls and McIntyre Brooks cleanup consists of:

### 1. Excavation of Contaminated Sediment

Sediment from Pauls and McIntyre Brook would be excavated using standard construction equipment, such as an excavator and/or backhoe. The volume of sediment to be excavated has been estimated to be 230 cubic yards at Pauls Brook and 2000 cubic yards at McIntyre Brook. The actual extent of the excavations will be determined by extensive sampling prior to the initiation of excavation activities.

### 2. Sediment and Erosion Control

Hay bales and silt screens would be used to minimize potential migration of contaminated sediments during construction.

### 3. Off-Site Disposal

The excavated material would be transported to an approved

off-base facility for treatment/disposal. Excavated material will be analyzed in accordance with the requirements of the selected treatment/disposal facility.

### 4. Wetlands Restoration

If excavation activities at McIntyre Brook result in impacts to surrounding wetlands, these wetlands will be restored. Following excavation, the McIntyre Brook will be backfilled with clean materials as is necessary to match previous or original design grades, and sideslopes will be revegetated as necessary for stabilization.

Damage to Pauls Brook and its surrounding wetlands will be unavoidable during excavation activities. It is not expected that the extent of wetlands impacted by excavation will be significant. However, excavation of Pauls Brook sediment is expected to impact adjacent mature forested wetlands. These wetlands will be reestablished after completion of excavation activities, however it will take many years for these wetlands to mature to present conditions.

### 5. Long-Term Monitoring

Surface water and sediment samples from Pauls and McIntyre Brooks will be collected and analyzed semiannually for the first 5 years following remediation and annually thereafter to monitor conditions within the brooks. Additional remedial actions may be considered if warranted.

**TABLE 1**  
**Comparative Ranking of Alternatives Against Evaluation Criteria Pauls and McIntyre Brooks**

Remedial Alternative	Protection of Human Health and Environment Ranking	Compliance with ARARs Ranking	Long-Term Effectiveness Ranking	Reduction in TMVa of Contaminants Through Treatment Ranking	Short-Term Effectiveness Ranking	Implementability Ranking	Cost Analysis <sup>b</sup> (in \$1,000)	State Acceptance	Community Acceptance
1. No action.	BC	C	BC	C	B	AB	26.2	TBEc	TBEc
2. Limited action (surface water and sediment monitoring).	B	C	B	C	AB	AB	661	TBEc	TBEc
3. Excavation of selected Pauls Brook and McIntyre Brook sediment and off-site disposal.	AB	AB	B	C	AB	B	1,182	TBEc	TBEc

"A" indicates that the alternative meets the intent of criterion.

"B" indicates that the alternative partially meets the intent of the criterion.

"C" indicates that the alternative does not meet the intent of the criterion.

"AB" and "BC" were used to denote rankings that fell between "A," "B," and "C."

<sup>b</sup>Estimated costs represent the 30-year present-worth cost.

aTMV = toxicity, mobility, and volume.

cTBE = to be evaluated after the public comment period.